

**FEE TRANSMITTAL FOR FY 2005**

Effective on 12/08/2004. Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

TOTAL AMOUNT OF PAYMENT (\$) 500.00

Complete if Known:

Application No. 10/020,655
Filing Date 12/11/01
First Named Inventor Wang
Examiner Name T. Vo
Art Unit 2613
Attorney Docket No. 80398.P468

 Applicant claims small entity status. See 37 CFR 1.27.**METHOD OF PAYMENT** (check all that apply)☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify) Deposit AccountDeposit Account Number : 02-2666Deposit Account Name: ☒ The Director is Authorized to do the following with respect to the above-identified Deposit Account:☐ Charge fee(s) indicated below.☒ Charge any additional fee(s) or underpayment of fee(s) during the pendency of this application.☐ Charge fee(s) indicated below except for the filing fee☒ Credit any overpayments.☒ Any concurrent or future reply that requires a petition for extension of time should be treated as incorporating an appropriate petition for extension of time and all required fees should be charged.

Warning: Information on this form may become public. Credit card information should not be included on this form.
Provide credit card information and authorization on PTO-2038.

FEE CALCULATION**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Large Entity		Small Entity		Fee Description		Fees Paid (\$)
Fee Code	Fee (\$)	Fee Code	Fee (\$)			
1011	300	2011	150	Utility application filing fee	1,000/500	_____
1111	500	2111	250	Utility search fee		_____
1311	200	2311	100	Utility examination fee		_____
1012	200	2012	100	Design application filing fee	430/215	_____
1112	100	2112	50	Design search fee		_____
1312	130	2312	65	Design examination fee		_____
1013	200	2013	100	Plant filing fee	660/330	_____
1113	300	2113	150	Plant search fee		_____
1313	160	2313	80	Plant examination fee		_____
1004	300	2004	150	Reissue filing fee	1,400/700	_____
1114	500	2114	250	Reissue search fee		_____
1314	600	2314	300	Reissue examination fee		_____
1005	200	2005	100	Provisional application filing fee		_____
SUBTOTAL (1) \$						<u>0</u>

2. EXCESS CLAIM FEES

		<u>Extra Claims</u>	<u>Fee from below</u>	<u>Fees Paid (\$)</u>
Total Claims	_____ - 20 or HP = _____		X _____	= _____
HP = highest number of total claims paid for, if greater than 20				
Independent Claims	_____ - 3 or HP = _____		X _____	= _____
HP = highest number of independent claims paid for, if greater than 3				
Multiple Dependent Claims			_____	= _____

<u>Large Entity</u>		<u>Small Entity</u>		
Fee Code	Fee (\$)	Fee Code	Fee (\$)	<u>Fee Description</u>
1202	50	2202	25	Each claim over 20
1201	200	2201	100	Each independent claim over 3
1203	360	2203	180	Multiple dependent claims, if not paid
1204	200	2204	100	Reissue: each claim over 20 and more than in the original patent
1205	50	2205	25	Reissue: each independent claim more than in the original patent

SUBTOTAL (2) \$ 0

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

<u>Total Sheets</u>	<u>Extra Sheets</u>	<u>Number of each add'l 50 or fraction thereof</u>	<u>Fee from below</u>	<u>Fees paid (\$)</u>
_____	- 100 = _____	/ 50 = _____ (round up to whole number)	X _____	_____

<u>Large Entity</u>		<u>Small Entity</u>		
Fee Code	Fee (\$)	Fee Code	Fee (\$)	<u>Fee Description: Application size fee for each additional group of 50 sheets beyond initial 100 sheets (count spec & drawings except sequences & program listings):</u>
1081	250	2081	125	Utility
1082	250	2082	125	Design
1083	250	2083	125	Plant
1084	250	2084	125	Reissue

SUBTOTAL (3) \$ 0

FEE CALCULATION (continued)**4. OTHER FEE(S)**

				Fees Paid (\$)	
Non-English Specification, \$130 fee (no small entity discount)					
Large Entity		Small Entity			
Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for ex parte reexamination	
1813	8,800	1813	8,800	Request for inter parties reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	120	2251	60	Extension for reply within first month	
1252	450	2252	225	Extension for reply within second month	
1253	1,020	2253	510	Extension for reply within third month	
1254	1,590	2254	795	Extension for reply within fourth month	
1255	2,160	2255	1,080	Extension for reply within fifth month	
1401	500	2401	250	Notice of Appeal	
1402	500	2402	250	Filing a brief in support of an appeal	500.00
1403	1,000	2403	500	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	500	2452	250	Petition to revive - unavoidable	
1453	1,500	2453	750	Petition to revive - unintentional	
1501	1,400	2501	700	Utility issue fee (or reissue)	
1502	800	2502	400	Design issue fee	
1503	1100	2503	550	Plant issue fee	
1462	400	1462	400	Petitions to the Commissioner (CFR 1.17(f) Group I)	
1463	200	1463	200	Petitions to the Commissioner (CFR 1.17(g) Group II)	
1464	130	1464	130	Petitions to the Commissioner (CFR 1.17(h) Group III)	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	For filing a submission after final rejection (see 37 CFR 1.129(a))	
1814	130	2814	65	Statutory Disclaimer	
1810	790	2810	395	For each additional invention to be examined (see 37 CFR 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	
1504	300	1504	300	Publication fee for early, voluntary, or normal pub.	
1505	300	1505	300	Publication fee for republication	
1803	130	1803	130	Request for voluntary publication or republication	
1808	130	1808	130	Processing fee under 37 CFR 1.17(i) (except provisionals)	
1454	1,370	1454	1,370	Acceptance of unintentionally delayed claim for priority	
Other fee (specify) _____					
Other fee (specify) _____					
				SUBTOTAL (4)	\$ 500.00

*Reduced by Basic Filing Fee Paid

SUBMITTED BY:Typed or Printed Name: Sheryl Sue Holloway

Signature: _____

Date: Aug. 30, 2005Reg. Number: 37,850Telephone Number: 408-720-8300

Send to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450



Patent Docket No. 80398.P468

AF/2613
Patent
IFW

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:)	Examiner:	T. Vo
)		
Jason N. Wang, et. al.)	Art Unit:	2613
)		
Serial No. 10/020,655)	Confirmation No:	2853
)		
Filed: December 11, 2001)		
)		
For: SYSTEM AND METHOD FOR)		
BALANCING VIDEO)		
ENCODING TASKS BETWEEN)		
MULTIPLE PROCESSORS)		
)		

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

This is an appeal to the Board of Patent Appeals and Interferences from the decision of the Examiner of Group 2613, dated March 31, 2005, in which claims 1-10, 12-21, 23-30 and 32-39 in the above-identified application were finally rejected. This Appeal Brief is hereby submitted pursuant to 37 C.F.R. § 41.37(a).

I. REAL PARTY IN INTEREST

The real party in interest is the assignee of the full interest in the invention, Sony

Electronics, Inc., 1 Sony Drive, Park Ridge, New Jersey 07656.

09/02/2005 AKELECH1 00000011 10020655

01 FC:1402

500.00 OP

II. RELATED APPEALS AND INTERFERENCES

To the best of Appellant's knowledge, there are no appeals or interferences related to the present appeal that will directly affect, be directly affected by, or have a bearing on the Board's decision in the instant appeal.

III. STATUS OF THE CLAIMS

Claims 1-10, 12-21, 23-30 and 32-39 are pending in the application and were finally rejected in an Office Action mailed March 31, 2005. Claims 1-10, 12-21, 23-30 and 32-39 are the subject of this appeal. A copy of Claims 1-10, 12-21, 23-30 and 32-39 as they stand on appeal are set forth in Appendix A.

IV. STATUS OF AMENDMENTS

No amendments to the claims have been made after receipt of the Final Office Action.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Appellant's invention as claimed in claims 1-10, 12-21, 23-30 and 32-39 is directed to processing variable length video encoding tasks with a co-processor while concurrently processing other, i.e., non-variable, encoding tasks with a main processor. [Specification: Paragraphs 19-22; Figures 2-4] A video encoding process allocates the variable and non-variable encoding tasks to the co-processor and main processor, respectively. [Specification: Paragraphs 20-24; Figure 3-4] The non-variable encoding tasks comprise one or more of motion estimation, pre-processing, mode selection, forward discrete cosine transform computation, forward quantization computation, rate control, zig zag scanning, inverse discrete cosine transform computation, inverse quantization computation, and motion compensation. [Specification: Paragraphs 19 and 22; Figures 2 and 4] The variable encoding tasks comprise macroblock header encoding, motion vector encoding, and discrete cosine transform coefficients encoding. [Specification: Paragraph 24; Figure 4] Furthermore, the non-variable motion estimation task comprises a first phase of top to top and bottom to bottom searching, and a second

phase of top to bottom and bottom to top searching. [Specification: Paragraph 19; Figure 2]

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

I. Claims 1-4, 7-9, 11-15, 18-25, 28, 29, 31-34, and 37-39 stand rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,781,788 to Woo et al.

II. Claims 6, 17, 27, and 36 stand rejected under 35 U.S.C. § 103(a) over Woo et al. in view of U.S. Patent No. 6,229,850 to Linzer et al.

III. Claims 5, 16, 26, and 35 stand rejected under 35 U.S.C. § 103(a) over Woo et al. in view of U.S. Patent No. 6,317,460 to Lee et al.

VII. ARGUMENTS

I. Claims 1-4, 6-9, 11-15, 18-25, 28, 29, 31-34, and 37-39 are Patentable under 35 U.S.C. § 102(b) over Woo et al.

Although the Examiner classified his rejection of claim 6 under 35 U.S.C. §103 over Woo and Linzer, he argued that Woo alone taught all the elements of claim 6. Accordingly, Appellant is grouping claim 6 with the rejections under 35 U.S.C. §102(b) over Woo.

Claims 1-4, 6-9, 11-15, 18-25, 28, 29, 31-34, and 37-39 stand or fall together. Claim 1 is the representative claim. The invention claimed in claim 1 concurrently processes variable length encoding tasks with a co-processor and non-variable length encoding tasks with a main processor.

Woo discloses simultaneously encoding and decoding video using a single video compression/decompression chip. As shown in Figure 2, the video chip comprises separate circuitry to perform run length encoding (RLC 92) and variable length encoding (VLC 98) on video input. The results of the run length encoding circuit are input into the variable length encoding circuit. Thus, Woo first encodes the video using run length encoding and then encodes the RLC encoded data with a variable length encoder. Woo discloses the video chip includes a CPU to coordinate the RLC and variable length encoding operations. In addition, Woo discloses separate circuitry components for motion vector encoding and discrete cosine transform encoding.

The Examiner asserts that Woo discloses the claimed concurrent variable encoding by a co-processor and non-variable encoding by a main processor because “the processing of the first group of video encoding tasks ... is executed by the CPU concurrently with the processing of the second group of video tasks” by the variable length encoder. However, Woo does not teach or suggest that the CPU performs video encoding tasks and thus there is no support for the Examiner's assertion. Appellant further notes the Examiner is apparently equating Woo's pipelined operations with Appellant's concurrent operations. As well known in the art, a pipelined operation is a serial operation, not a concurrent operation. Thus, the Examiner's interpretation of Woo as anticipating Applicant's claimed concurrent variable and non-variable encoding operations is incorrect.

The Examiner also asserts that Woo's run length encoder “is considered a main processor that ... processes a first group of video encoding [tasks]”. However, the run length encoder and the variable length encoder in Woo cannot concurrently operate on the same input because the results of the run length encoder are input into the variable length encoder.

Therefore, Woo does not anticipate concurrently processing variable length encoding tasks with a co-processor and non-variable length encoding tasks with a main processor as claimed in claim 1. Accordingly, Appellant respectfully submits that the invention claimed in claims 1-4, 6-9, 11-15, 18-25, 28, 29, 31-34, and 37-39 is patentable under 35 U.S.C. § 102(b) over Woo.

II. Claims 17, 27, and 36 are Patentable under 35 U.S.C. § 103(a) over Woo et al in view of Linzer et al.

Claims 17, 27, and 36 stand or fall together. Claim 17 is the representative claim. Claim 17 depends from claim 14 and further defines pre-processing as noise reduction. As noted above, claim 6 has been argued under the § 102 rejections.

Linzer discloses creating multiple resolution versions of a video signal by using a high quality video compressor to create high quality compressed video and a low quality video compressor to create low quality compressed video. Both video compressors use the same video input signal when creating the multiple resolution video versions.

The Examiner admits that Woo does not teach or suggest noise reduction pre-processing and relies on Linzer as disclosing the claimed element. However, there is no disclosure in Linzer that teaches or suggests any type of noise reduction. Accordingly, Linzer cannot be properly interpreted as teaching or disclosing noise reducing pre-processing as claimed.

Therefore, the combination of Woo and Linzer cannot render obvious the invention as claimed in claim 17. Accordingly, Appellant respectfully submits that the invention claimed in claims 17, 27, and 36 is patentable under 35 U.S.C. § 102(b) over the combination of Woo and Linzer.

III. Claims 5, 16, 26, and 35 are Patentable under 35 U.S.C. § 103(a) over Woo et al in view of Lee et al.

Claims 5, 16, 26, and 35 stand or fall together. Claim 5 is the representative claim. Claim 5 depends from claim 3 and further defines motion estimation as comprising a first phase including a top to top and bottom to bottom searching and a second phase a top to bottom and bottom to top searching.

Lee discloses creating motion vectors used in video compression by interpolating from a different set of motion vectors. However, Lee does not teach or suggest that a main processor performs a motion estimation encoding task while a co-processor is concurrently performing variable length video encoding task as claimed.

Thus neither Woo, nor Lee, teach or suggest concurrent processing of variable and non-variable encoding tasks as claimed in claim 5. Accordingly, Appellant respectfully requests the withdrawal of the rejection of claims 5, 16, 26 and 35 under 35 U.S.C. § 103(a) over the combination of Woo and Lee.

VIII. CONCLUSION

Woo does not anticipate Appellant's invention as claimed in claims 1-6, 7-9, 11-15, 18-25, 28, 29, 31-34, and 37-39. Furthermore Woo in combination with Linzer and Lee does not render obvious Appellant's invention as claimed in claims 17, 27, and 36 and 5, 16, 26, and 35, respectively. Therefore, Appellant respectfully requests the Board

reverse the rejections of pending claims 1-10, 12-30, and 32-39, and direct the Examiner to enter a Notice of Allowance for the pending claims.

Fee for Filing a Brief in Support of Appeal

Enclosed is a check in the amount of \$500.00 to cover the fee for filing a brief in support of an appeal as required under 37 C.F.R. §§ 1.17(c) and 41.37(a).

Deposit Account Authorization

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due. Furthermore, if an extension is required, then Appellant hereby requests such extension.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR
& ZAFMAN LLP

Dated: August 30, 2005



Sheryl Sue Holloway
Registration No. 37,850

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8300 x309



Patent Docket No. 080398.P468

Patent

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:) Examiner: T. Vo
)
Jason N. Wang, et al.) Art Unit: 2672
)
Application No. 10/020,655) Confirmation No: 2853
)
Filed: December 11, 2001)
)
For: SYSTEM AND METHOD FOR)
BALANCING VIDEO)
ENCODING TASKS BETWEEN)
MULTIPLE PROCESSORS)

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**APPENDIX A FOR
APPELLANT'S BRIEF UNDER 37 C.F.R. 41.37(a)**

1. (Previously Presented) A system comprising:

an interface coupled to a bus to receive a real time video stream;

a main processor coupled to the bus, the main processor to process a first group of video encoding tasks comprising those video encoding tasks not including variable length encoding involved with encoding the real time video stream;

a co-processor coupled to the bus, the co-processor to process a second group of view encoded tasks including a variable length encoding tasks involved with encoding the real time video stream, wherein the processing of the first group of video encoding tasks is executed concurrently with the processing of the second group of video encoding tasks.

2. (Original) The system of claim 1 wherein the first group of video encoding tasks and the second group of video encoding tasks comprise those tasks required of at least one of the Moving Pictures Expert Group (MPEG) standards for video encoding.

3. (Original) The system of claim 1 wherein:

the first group of video encoding tasks comprises at least motion estimation, pre-processing, mode selection, forward discrete cosine transform computation, forward quantization computation, rate control, zig zag scanning, inverse discrete cosine transform computation, inverse quantization computation, and motion compensation; and

the second group of video encoding tasks comprises variable length encoding computation.

4. (Original) The system of claim 3 wherein the variable length encoding computation comprises:

macroblock header encoding;
motion vector encoding; and
discrete cosine transform coefficients encoding.

5. (Original) The system of claim 3 wherein the motion estimation comprises:

a first phase includes top to top searching and bottom to bottom searching; and
a second phase includes top to bottom searching and bottom to top searching.

6. (Original) The system of claim 3 wherein the pre-processor is a variable length encoder/decoder co-processor.

7. (Original) The system of claim 1 wherein the co-processor is a variable length encoder/decoder co-processor.

8. (Original) The system of claim 1 wherein the interface is at least one of a broadcast interface and a network interface.

9. (Original) The system of claim 1 further comprising:

- an audio output interface; and
- a video output interface.

10. (Original) The system of claim 1 wherein the real time video stream is at least one of a television signal received wirelessly and a television stream received via a hardwired connection.

11. (Canceled)

12. (Previously Presented) A system comprising:

- a main processor coupled to a bus;
- a co-processor coupled to the bus;
- a main memory coupled to the bus;
- an interface coupled to the bus to receive a real time video stream; and
- a video encoding process executed from the main memory by the main processor to cause the main processor to allocate a first group of video encoding tasks comprising those video encoding tasks not including variable length encoding involved with encoding the real time video stream according to a well known standard to the main processor and allocate to the co-processor a second group of video encoding tasks comprising variable length encoding tasks involved with encoding the real time video stream according to the well known standard, wherein the main processor processes the first group of video encoding tasks concurrently with the co-processor processing the second group of video tasks.

13. (Original) The system of claim 12 wherein the well known standard is at least one of the Moving Pictures Expert Group (MPEG) standards for video encoding.

14. (Previously Presented) The system of claim 12 wherein the encoding tasks comprises at least motion estimation, pre-processing, mode selection, forward discrete cosine transform computation, forward quantization computation, rate control, zig zag scanning,

inverse discrete cosine transform computation, inverse quantization, and motion compensation; and

the second group of video encoding tasks comprises variable length encoding computation.

15. (Original) The system of claim 14 wherein the variable length encoding computation comprises:

macroblock header encoding;
motion vector encoding; and
discrete cosine transform coefficients encoding.

16. (Original) The system of claim 14 wherein the motion estimation comprises:

a first phase includes top to top searching and bottom to bottom searching; and
a second phase includes top to bottom searching and bottom to top searching.

17. (Original) The system of claim 14 wherein the pre-processing comprises:
noise reduction.

18. (Previously Presented) The system of claim 12 wherein the co-processor is a variable length encoder/decoder co-processor.

19. (Previously Presented) The system of claim 12 wherein the interface is at least one of a broadcast interface and a network interface.

20. (Previously Presented) The system of claim 12 further comprising:

an audio output interface; and
a video output interface.

21. (Previously Presented) The system of claim 12 wherein the real time video stream is at least one of a television signal received wirelessly and a television stream received via a hardwired connection.

22. (Canceled)

23. (Previously Presented) The method of claim 28 wherein the video encoding is performed according to at least one of the Moving Pictures Expert Group (MPEG) standards for video encoding.

24. (Previously Presented) The method of claim 28 wherein:

the first group of video encoding tasks comprises at least motion estimation, pre-processing, mode selection, forward discrete cosine transform computation, forward quantization computation, rate control, zig zag scanning, inverse discrete cosine transform computation, inverse quantization computation, and motion compensation; and

the second group of video encoding tasks comprises variable length encoding computation.

25. (Original) The method of claim 24 wherein the variable length encoding computation comprises:

macroblock header encoding;
motion vector encoding; and
discrete cosine transform coefficients encoding.

26. (Original) The method of claim 24 wherein the motion estimation comprises:
a first phase that includes top to top searching and bottom to bottom searching; and
a second phase that includes top to bottom searching and bottom to top searching.

27. (Original) The method of claim 24 wherein the pre-processing comprises:
noise reduction.

28. (Previously Presented) A method for video encoding comprising:

receiving a real time video stream;
performing picture level and upper processing on a main processor;

executing a macroblock loop in parallel on the main processor and a co-processor, wherein executing includes processing on the main processor a first group of video encoding tasks comprising those video encoding tasks not included in the variable length encoding involved with encoding the real time video stream according to the well known standard concurrently with the processing on the co-processor a second group of video encoding tasks comprising variable length encoding tasks involved with encoding the real time video stream according to a well known standard; and

outputting an encoded version of the real time video stream.

29. (Previously Presented) The method of claim 28 wherein the co-processor is a variable length encoded/decoder co-processor.

30. (Previously Presented) The method of claim 28 wherein the real time video stream is at least one of a television signal received wirelessly and a television stream received via a hardwired connection.

31. (Canceled)

32. (Previously Presented) The method readable medium of claim 37 wherein the first group of video encoding tasks and the second group of video encoding tasks comprise those tasks required of at least one of the Moving Pictures Expert Group (MPEG) standards for video encoding.

33. (Previously Presented) The machine readable medium of claim 37 wherein:

the first group of video encoding tasks comprises at least motion estimation, pre-processing, mode selection, forward discrete cosine transform computation, forward quantization computation, rate control, zig zag scanning, inverse discrete cosine transform computation, inverse quantization computation, and motion compensation; and

the second group of video encoding tasks comprises variable length encoding computation.

34. (Original) The machine readable medium of claim 33 wherein the variable length encoding computation comprises:

- macroblock header encoding;
- motion vector encoding; and
- discrete cosine transform coefficient encoding.

35. (Original) The machine readable medium of claim 33 wherein the motion estimation comprises:

- a first phase that includes top to top searching and bottom to bottom searching; and
- a second phase that includes top to bottom searching and bottom to top searching.

36. (Original) The machine readable medium of claim 33 wherein the pre-processing comprises:

- noise reduction.

37. (Previously Presented) A machine readable medium having instructions stored thereon which when executed by a main processor cause the main processor perform operations to encode a real video stream, the operations comprising:

- allocating a first group of video encoding tasks comprising those video tasks not included in the variable length encoding to the main processor;

- allocating a second group of video encoding tasks comprising variable length encoding tasks involved with encoding the real time video stream according to a well known standard to the co-processor; and

- processing the first group of video encoding tasks by the main processor concurrently with the processing of the second group of video encoding tasks by the co-processor.

38. (Previously Presented) The machine readable medium of claim 37 wherein the co-processor is a variable length encoded/decoder co-processor.

39. (Previously Presented) The machine readable medium of claim 37 wherein the real time video stream is at least one of a television signal received wirelessly and a television stream received via a hardwired connection.